

## PATENT SPECIFICATION

DRAWINGS ATTACHED

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## COMPLETE SPECIFICATION

## Improvements in Crank Driven Switching Mechanisms

We, ROBERT BOSCH GMBH, a German Company of 4, Breitscheidstrasse, Stuttgart-W, Germany, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to a switching mechanism for accomplishing switching operation movements, and comprising a crank, a switching element and a connecting linkage connecting the crank to the switching element. Such switching operations may, for example, be gear-changing operations in the gear box of a mechanically propelled vehicle.

Switching mechanisms are already known in which the connecting linkage comprises a connecting rod guided in a guide block or in a rotatable longitudinal guide. The movements produced by these mechanisms were hitherto only rectilinear, arc shaped or of elliptical form.

An object of the present invention is to provide a switching mechanism in which the switching element is capable of accomplishing one after another several forms of movement, that is, similar to the path which is required in changing gear in a gearbox with an H gear-change movement.

In accordance with the present invention the connecting linkage comprises a resiliently flexible connecting rod which is guided at its end connected to the switching element by switching gate slots contained in a fixed guide and at its middle region by a slide bearing mounted at least approximately in a plane through the crank axis and one of the gate slots. The prescribed switching path is traversed by the switch element through the gate slots when the crank rotates, during which, according to the direction of the straight portion of the part of the path traversed by the switching element, the connecting rod is bent to a greater or lesser extent and releases the energy stored in it due to bending in traversing

a portion of path approximately perpendicular to the longitudinal axis of the connecting rod.

For producing this kind of compound movement, devices have hitherto been known which have two straight line acting motors arranged at right angles to each other and controlled according to the desired shape of the path of movement. With respect to these the switching mechanism in accordance with the invention offers the advantage that only a single actuating motor is required. Also these known devices have the disadvantage that in switching movements which are composed of part movements at right angles to each other, the frequent acceleration and braking of the individual motors is necessary, whereas with the device in accordance with the invention the change of the direction of movement is very rapidly obtained by the progressively stored spring energy of the flexible connecting rod.

A further advantage of the switching mechanism of the invention is the simple selection of the switching path for the switching element given by the gate slots, since according to the direction of rotation initiated in the crank the switching element will be guided through the various switching gate slots.

The invention will be further described, by way of example, with reference to the accompanying drawings in which:—

Fig. 1 is a schematic elevation of a switching mechanism provided on a vehicle gearbox and constructed in accordance with the invention;

Fig. 2 is a plan view, on the plane II—II of Fig. 1 of the switching mechanism;

Fig. 3 is a plan view of an interlocking guide of the mechanism;

Figs. 4 to 7 illustrate the sequence of movements of the change-speed gear box schematically.

The switching mechanism illustrated in the drawings serves for the accomplishment of the gear change movements on an automobile gearbox 5 of normal design with an H gear change sequence for four forward speeds and

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